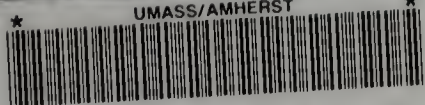


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ENVIRONMENTAL

RESOURCE

Massachusetts Department of Natural Resources

Arthur W. Brownell, Commissioner

May - June 1972

Number Three

THE GREENING OF THE CITIES

For years city outdoor recreation and open-space needs have taken a backseat to such pressing urban problems as housing, transportation, welfare and unemployment. Urban-oriented agencies like the state's Metropolitan District Commission, and, since the mid-1960's the federal government's Department of Housing and Urban Development (HUD), have done much to provide recreation opportunities for metropolitan areas. And some cities, too, have been sensitive to outdoor recreation needs. But, for the most part, parks and outdoor recreation facilities were, of necessity, built in the forested Berkshires and rural Connecticut Valley in the western part of the state where open-space land was available and relatively inexpensive.

In the east, particularly in the metropolitan Boston area, where about one-third of the state's 5.6 million people now live, urbanization since World War II has spread largely unchecked over the land. The result is that today, according to a recent report by our Department's statewide planning unit, urban areas in the east are woefully lacking in recreation land and facilities. And core cities such as Boston,

Cambridge, Somerville, Chelsea and Everett have only three percent outdoor recreation land. Indeed, looking out over these cities, one sees an unbroken stretch of concrete and brick buildings, encircled and knotted by a maze of asphalt and steel expressways.

Though things seem bleak for our cities, there is hope on the horizon. Untapped and underutilized resources exist there. To begin with, many of the Commonwealth's cities possess great water-based recreation potentials. For example, Springfield and Chicopee are located on the Connecticut River, Lawrence and Lowell on the Merrimack, and Boston is not only situated on a harbor but three rivers — the Charles, Mystic and Neponset — flow through the city.

Plans are already under way to upgrade these waters for boating, fishing and, in some portions, swimming, and to widen the range of recreation opportunities on the rivers' adjacent lands. The Metropolitan District Commission, for example, has proposed a five-year expenditure of \$15 million to restore and relandscape along the Charles, Neponset and Mystic rivers. And our Department, along with the MDC and U.S. Army Corps of Engineers, has begun to implement the Charles River Corridor Plan which will eventually create a continuous con-

servation and recreation land corridor along the Charles River from Boston Harbor to Echo Lake in Milford and Hopkinton.

At present the most ambitious plan on the drawing boards is the development of the Boston Harbor Islands. Until now an untapped or underutilized natural resource, the harbor and its islands are to be developed into a great urban water park. Covering an area of 47 square miles, the Boston Harbor development will offer exceptional opportunities for boating, fishing, camping, and even swimming when the harbor's waters are cleaned up. Many of the 30 islands in the harbor, totaling about 1150 acres, will be developed for such activities as hiking, picnicking and nature interpretation. Our Department, which is directing the project, hopes that Phase I of the plan — acquisition of the islands — will begin within the next two years.

To be sure these plans for river and harbor development are costly and at this point still lie closer to planning rather than public domain. Yet in the meantime other strategies for "opening up" recreational opportunities in urban areas can be pursued on both state and local levels. For one thing the federal government, through the Bureau of Outdoor Recreation's Land and Water Conservation Fund, and



Boston Harbor left: renovation could make it safe for fishing

Photo Credit: M.A.P.C.

the state through the Self-Help Program, offer considerable financial assistance to municipalities and other organizations that wish to buy and develop lands for outdoor recreation use. These programs, both administered on the state level by our Department, can reimburse communities up to as much as 75 percent of costs for conservation land acquisition and development, plus 50 percent of the costs for design and construction of outdoor recreation facilities.

Last year the city of Worcester, for example, took a big step in slowing down urban sprawl, and guaranteeing future public use within city limits for fishing and boating, by purchasing the 41-acre Patches Pond. Cost of acquisition and development was \$280,000, of which 75 percent was reimbursed by HUD and state programs. This year East Boston has applied for a Land and Water Conservation Fund grant which would reimburse the city 50 percent of approximately \$400,000 for renovation of several major playgrounds. The largest single city project is in Newton where the city has approval for 50 percent reimbursement of a huge \$1 million recreational complex that will be used for skating in winter and basketball and tennis in other seasons. To be built on the MBTA line and open to everyone, this facility promises to benefit Boston and other surrounding communities as well as Newton.

Unfortunately, while these and other urban outdoor recreation projects demonstrate what can be done to provide recreational opportunities in urban areas with state and federal assistance, many cities are still unaware, or for one reason or another unable to take advantage of Land and Water Conservation and Self-Help funds or HUD's Legacy of Parks Program.

One of the best approaches for providing outdoor recreation opportunities in urban areas is to establish bicycle trails. Bicycling is currently enjoying an unprecedented boom because it is healthy exercise, a convenient mode of transportation, lots of fun, and a natural adaptation to the urban environment. What better way to explore the sights and sounds of a cityscape than on a bicycle?



Window on the Charles: open space in the shadow of high-rises

Photo Credit: M.A.P.C.

Moreover, bike trails are relatively cheap and fairly easy to put together, since they are usually created out of existing municipally owned streets and strips of land that are generally unsuitable for other kinds of development. Already several urban bike routes have been established. Among these are the newly created Boston Greenbelt, established by the city of Boston, which runs seven miles from Boston Common to Franklin Park, a recreation and bike trail in Springfield, and the New Bedford Bikeway. Soon to be completed is the Paul Dudley White bike route along the Charles River in Cambridge (named for the famous Boston heart surgeon who has been a major inspiration for the biking movement).

Basic to the quest for recreational space in the cities is an environmental consciousness, a concept of the city as more than a place of high-rise apartments and asphalt streets; a city must also contain open spaces and green segments as well. With this attitude in mind possibilities multiply: parking lots, schoolyards and rooftops can be adapted to serve as playgrounds; in winter, hilly streets can be restricted for sledding and depressed surfaces can be flooded for skating; jetties and piers can be renovated for fishing; commons can be landscaped and protected; streets can be cleaned and lined with trees.

Wetlands, invaluable natural resources, can be protected from development and used for nature study and, in some cases, even for hunting. Privately owned golf courses and agricultural land could be granted tax abatements to encourage their continuance as recreation land or open spaces. Public access sites and transit accommodations could be planned to provide optimum advantage for recreational use of land and facilities.

Obviously, given their political structure and financial condition, cities can not go it alone in meeting the recreational demands of their citizens. On our part the Department has just completed a statewide recreation plan calling for a concerted effort to develop recreation land and facilities in long-neglected urban areas. We particularly intend to emphasize programs that provide recreation opportunities for the elderly, handicapped and disadvantaged, groups which comprise a significant segment of the urban population. (Of the state's 620,000 senior citizens, nearly half live in the Boston metropolitan area.)

Ultimately, though, the dream of the greening of our cities will demand, as the statewide planning unit's report points out, a comprehensive plan because city problems can not be solved piecemeal or in a vacuum, but only on the basis of total land-use planning — planning for housing, in-

mercurial monarch its upper slopes are sometimes wrapped in white mists, sometimes in purple grandeur. Its lofty peak offers a spectacular four-state view. In summer, visitors include many bird lovers who come there to see Bicknell's thrush and the blackpoll warbler which nest nowhere else in the state. But the Reservation's 8187 acres and 35 miles of hiking trails afford singular opportunities for a solitary hiking experience. Besides the A.T., other good trails are the Mount Prospect, Cheshire Harbor, Roaring Brook, Money Brook and Hopper trails.

A real sleeper is Pittsfield State Forest in Pittsfield. From Pittsfield's campsites on Berry Pond, hike the Taconic Skyline Trail and on a clear day you can see Albany. Near Berry Pond stretch 100 acres of pink azaleas. Best time to go is the second week in June when the flowers are in full bloom.

Mohawk Trail State Forest: About 110 miles from Boston on Route 2 in Charlemont, a classic New England town with a covered bridge. In colonial times the ancient Mohawk warpath ran through the forest and the area was notorious for its bloody clashes during the French-Indian Wars. Today Mohawk Trail State Forest has lost little of its natural beauty; 6457 acres of deep gorges and mountain ridges are covered with maple, gray birch, and majestic pines as tall as 100 feet. Besides hiking, there is horseback riding, hunting and fishing in two of the state's best trout streams — the Cold and Deerfield rivers.

Campsites are situated in a wooded area along the north bank of the Cold River. From here hike up the Indian Trail to two of the highest peaks in the forest, Mounts Clark and Todd. Camping costs: parking, \$1.00 per day; tentsites, \$3.00 per day. There are also a few cabins, costing \$6.00 per day for one room and \$8.00 per day for three rooms. However, these must be reserved in advance. (Write to: Supervisor, Mohawk Trail State Forest, Forest Headquarters, Route 2, Charlemont, Massachusetts.)

PIONEER VALLEY

Part of the vast Connecticut River watershed, the Pioneer Valley is a

fertile alluvial plain stretching out like a quilt and composed of tobacco fields, apple orchards, evergreens and hardwood groves. Across the southern section of this gently rolling valley the sawtooth ridges of the Mount Holyoke Range jut up.

A bird's-eye view of this vast landscape is provided by Mount Holyoke in Skinner State Park. To reach the summit, take either Mount Holyoke Summit Trail, short but steep; South Side Trail, little used, overgrown and somewhat obscure; or Metacomet Trail, marked with white rectangular blazes. On the summit stands Mountain House, built in 1821. Later enlarged and renamed Prospect House, it was once a resort for such American notables as Daniel Webster, Franklin Pierce and Emily Dickinson, as well as foreign visitors such as Charles Dickens, William Wordsworth and Jerome Napoleon Bonaparte. In the summer you can still sit on the House's rambling veranda, watch hawk migrations soar past, and gaze down on a panorama that Thoreau described as one of the most spectacular he had ever seen. The problem is that Skinner has no camping facilities. Closest place to camp under the stars is the D.A.R. State Forest in Goshen about 25 miles away.

Other camping, canoeing or fishing combinations: Utilizing Erving State Forest on Route 2 for camping, drop a canoe in the Connecticut River and drift downstream to Turners Falls, a plummeting cascade where, before the arrival of white men, Mohawks and other tribes relaxed and fished after the long winter. Or from Erving drive either Route 2 or 9 to Quabbin Reservoir, a vast 15-billion-gallon-capacity lake artificially created to supply Greater Boston's water needs. Stocked with trout and salmon, the battling kind found in New Hampshire and Maine, Quabbin is among the best fishing spots in the state. If you don't fish, hike paths leading to numerous points on the lake's jagged shoreline, climb the observation tower for a view of New Hampshire, watch deer munching berries off a trail, or, better yet, try to spot the vanishing bald eagle.

CENTRAL MASSACHUSETTS

Old Sturbridge Village: A pleasant weekend experience, one hour's ride from Boston to Sturbridge on the Massachusetts Turnpike. The Village is the best of its kind north of Williamsburg, Virginia. Genuine old buildings moved from all over New England to Sturbridge, the houses, blacksmith shop, gristmill, meeting hall and tavern constitute a typical Yankee settlement of the federal period. Such preindustrial crafts as spinning, weaving and candlestick making are authentically demonstrated. In the evening, camp out at Wells State Park or at any of several private campgrounds nearby.

THE COASTAL EXPERIENCE

A good part of the preservation and protection of Cape Cod's coastline has been assured by the federal government's acquisition and management of the 21,000-acre Cape Cod National Seashore. In addition, the Department of Natural Resources operates several state parks on the Cape and in the vicinity. Nickerson, Shawme-Crowell and Myles Standish State Forest are the largest. During peak-summer months camper-trailers from every state in the union, along with day-trippers from Boston, pile into these parks. You'll end up never getting out of the parking lot. Best bet: go to Bristol County and camp out in Massasoit State Park in Taunton off Route 24. From there drive Route 88 to Horseneck Beach in Westport where the water is warm and the surfing excellent. Or drive Route 6 to Demarest Lloyd State Park in South Dartmouth. Both beaches are on Buzzards Bay, not the leg section of the Cape, but for the most part they are quiet and solitary.

Plum Island: Thirty-five miles north of Boston off Route 1 at Newburyport. Most of the island is a national wildlife refuge, though the southern tip is a state preserve. Walk the trails along the shore, collect seashells, or watch rabbits, pheasants and shorebirds scoot out of the brush from every angle.





Chief Hurley: forester and fire fighter for 47 years

CAMPING AND HIKING IN MASSACHUSETTS

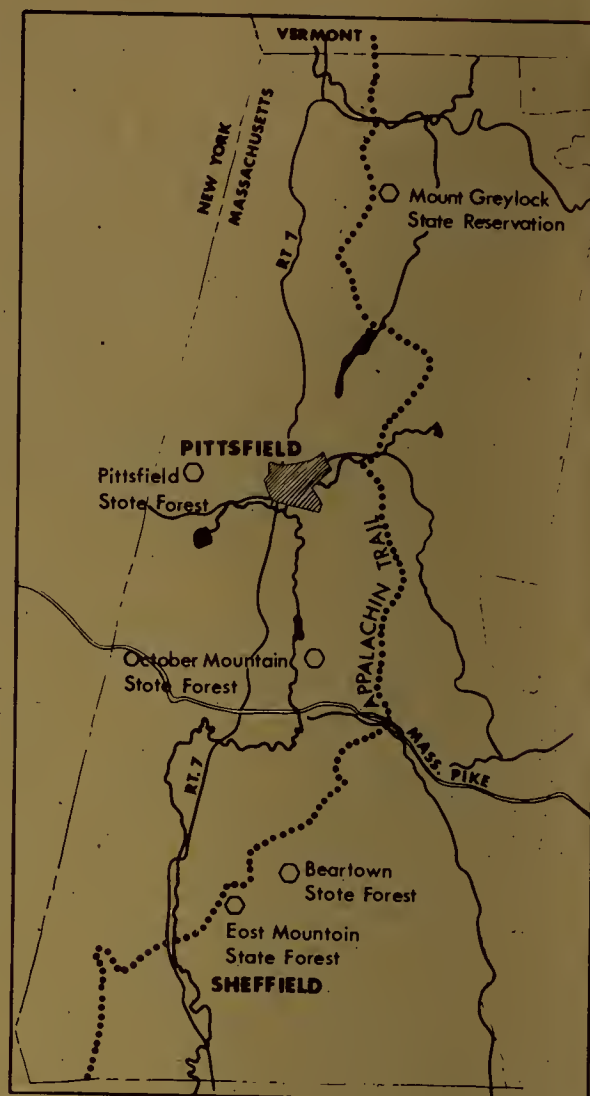
Below is a guide to some lesser publicized camping and hiking opportunities. This is by no means a laundry list of places to camp in Massachusetts; it offers just a few suggestions to spur on the imagination. For further information on camping and outdoor recreation, contact the Department of Natural Resources, Division of Forests and Parks, 100 Cambridge St., Boston 02202. A helpful guide to purchase: The A.M.C. Massachusetts and Rhode Island Trail Guide, the Appalachian Mountain Club, 5 Joy St., Boston.

THE BERKSHIRES

Appalachian Trail: A series of old Indian footpaths strung together in the 1930s by various private hiking clubs, the A.T. stretches from Maine to Georgia. Extending northward from the Connecticut to Vermont borders, the Massachusetts segment winds for 83 miles over the Berkshire mountains, through evergreen forests and deep gorges, across swift streams and past limpid ponds and cascading waterfalls. To hike almost its entire length, pick up the A.T. at Blackinton on Route 2, about 130 miles from Boston.

A few scenic and historical highlights along the Trail: Hoosic Valley, one of America's first industrial heartlands, where granite was cut to build Washington, D.C. and where many relics of that era can still be seen; Mount Greylock, highest peak in Massachusetts; Tyringham, one of the original Shaker settlements; Lime Kiln Road in Egremont, site of the last battle of Shays' Rebellion; Mount Everett, second only to Greylock for panoramic vistas.

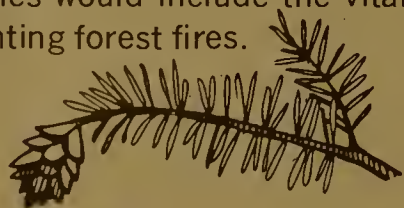
The A.T. is an ecological wonderland where man has been conspicuously absent for long periods of time. Rock formations include the hard and the soft — granite and sandstone; exotic vegetation such as Norway spruce and swamp oak, endemic to the Carolinas, flourish there. And so does a great variety of wildlife: black bears, bobcats, deer, raccoon, porcupines, wild turkeys and even an occasional eagle or vulture.



Hiking the A.T. is free, with the exception of campsite accommodations. Lean-to and tent campsites can be found on the Trail at DNR-operated Mount Greylock State Reservation and at October Mountain and Beartown State forests. Lean-to's are free on a first-come-first-served proposition and campsites rent on the same basis. Campsite prices: individual, \$2.00 a day; group, \$6.00.

Warning: A.T. is no easy trek. Even avoiding the side trails which permit rock climbing, a good hiker can cover no more than 12 miles a day. So be prepared to take at least a week. (For further information on the Trail, purchase Guide to the Appalachian Trail in Massachusetts and Connecticut, Appalachian Trail Conference, 5 Joy St., Boston. Several sporting goods stores also carry this indispensable guide.)

Those with less time and zeal should select a small section of the A.T. Best place is Mount Greylock State Reservation. From Boston, about 3 hours' driving time, take Route 2 to North Adams; then turn down Route 8 to the reservation. Soaring 3491 feet above sea level, Mount Greylock dominates the northwestern Massachusetts countryside. Like a



dustry, transportation, water supply, waste disposal, as well as recreation. Realization of a comprehensive plan, in turn, requires cooperative efforts on state and local government levels right down to the grassroots.

Arthur W. Brownell

Arthur W. Brownell. Commissioner

FIRE FIGHTING: THE FRONT LINE OF FOREST PROTECTION

With air and water pollution capturing the environmental headlines these days there is a tendency to forget the age-old scourge on our landscape — forest fires. Yet every year forest fires still devastate thousands of acres in Massachusetts. Only the basic conservation practice of fire control prevents disastrous destruction of our timber resources. In fact, it was a gigantic conflagration, laying waste 7000 acres of woodland in Wendell, Massachusetts in the early 20th century, that was responsible for the establishment in 1911 of a state forest fire protection unit within the Division of Forestry (later to become the Division of Forests and Parks).

Over the years one man in particular, Howard E. Hurley, has been instrumental in encouraging increasingly sophisticated forest fire-fighting techniques. Chief Hurley, now 68, recently retired as the state's chief fire warden after 47 years of service with the Division of Forests and Parks.

When Chief Hurley first became involved with fire fighting, methods of fire prevention and control had changed little since state forest fire protection was first organized. Fire towers were frequently no more than scaffolding nailed up in trees, telephone communications were generally lacking, and it would take hours after detection for equipment to arrive on the scene. In those days equipment meant a pickup truck, provided with clanging gong and hand extinguishers, which bumped and bounced over rough dirt roads. Brooms, shovels and water-soaked gunnysacks were among the weapons used by fire fighters for defense.

Even as late as the 1940's the major fire-fighting attack was dependent on human nerve and muscle. Chief Hurley has not forgotten the days when he would strap a portable pump on his back and trudge through smoke-filled forests. "When fighting the big ones," he recalls, "we'd often be out for three days at a time."

Today forest fire fighting has become more sophisticated in detection and suppression. The state's Bureau of Forest Fire Control has 52 steel lookout towers, 200 mobile forest-fire patrolmen equipped with two-way radios and backup personnel, and 36 modern fire trucks which can move at a moment's notice. Gasoline-powered portable pumps can also tap on-the-spot sources of water (rivers, lakes, water holes) and "where no water is readily available," says Howard Hurley, "water-tank trucks can haul in large quantities to the scene."

In the dry summer months, especially on Cape Cod where there is a great deal of inflammable pitch pine and scrub oak, 35 "brush-breakers" are on call. These are specially designed trucks that can cut a firebreak by leveling shallow-rooted vegetation. In really bad fires the state can also resort to aircraft that "water drop" chemicals to smother flames.

Under Chief Hurley's direction several innovations and improvements in forest fire fighting were introduced. Radio communications were ex-

panded to include all counties. The mutual aid system between state and local fire departments was improved. More roads through the forests were built, enabling better and quicker access to fires. Weather stations, utilizing long-range forecasts, rainfall estimates and relative humidity and wind-speed direction data, were established to more accurately predict "fire weather." The "simulator," an electronic device used for training local as well as state fire-fighting personnel in fire control, was introduced.

In recent years the number of destructive forest fires in the state has declined substantially. In fact, last year was the least ruinous fire year on record in 25 years as only about 4,300 acres were burned off in the state. In part this decline has been due to the demise of the coal-burning railroad engine whose shower of sparks, erupting from the funnel while the train chugged past the forest, often ignited serious fires. (Diesels, of course, to a lesser degree, cause forest fires as a consequence of faulty brakes, hotboxes, and emissions of hot carbon from engine exhausts.) In part also, Public Health's recent ban on open burning, forbidding open-faced dumps and backyard incinerators, has helped to reduce the forest fire menace. But to a great extent the innovations and dedication of Chief Hurley, and many others like him, have had a good deal to do with



Reo fire truck circa 1921

BOSTON AREA

Not far from Boston are Bradley Palmer State Park in Topsfield and Harold Parker in North Reading. Harold Parker offers opportunities for camping and hunting. DNR's newest park, Wompatuck, is even closer. In Hingham, only 17 miles from Boston, Wompatuck is on the site of an old World War II ammunition depot. The Division of Forests and Parks is constructing camping facilities, an environmental education center, and paths through the dense forests. A few hints for discovering and enjoying the delightful and often obscure natural world: put on old sneakers, wade in the brooks and observe the aquatic world of fishes, water skaters or otters on the banks. Or lie on your belly as the Indian did and see shrew-eating earthworms and centipedes battling each other like behemoths; birds, squirrels, even foxes may frolic before your eyes. If you are really a pro, you might spot the bobcat, believed to have returned after being driven out of eastern Massachusetts many years ago.



COMMISSIONER REAPPOINTED

Governor Francis W. Sargent recently announced the reappointment of Arthur W. Brownell as Commissioner of Natural Resources. Commissioner Brownell, who was first appointed Commissioner in 1969, entered the Department in 1950 as a summer employee while still in high school. After receiving a B.S. degree in forest entomology from the University of Maine, he became a research forester for the U.S. Forest Service. In 1959 he returned to state government service as a Forest and Park Supervisor at Myles Standish State Forest in South Carver. Later he was transferred to Boston headquarters and in 1967 was appointed Director of the Division of Conservation Services.

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Publication of this document approved by Alfred C. Holland Publication no. 5790

RESOURCE Published by

MASSACHUSETTS DEPARTMENT
OF NATURAL RESOURCES,
DIVISION OF CONSERVATION SERVICES
LEVERETT SALTONSTALL BUILDING
100 CAMBRIDGE STREET
BOSTON, MASS. 02202

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THIS PUBLICATION WAS PRINTED ON 100% RECYCLED PAPER



The following are major environmental bills now under consideration in the Massachusetts legislature.

CITIZENS' RIGHTS-OF-ACTION BILL (H3577) — Last year legislation was passed enabling citizens to take to court "persons" violating existing anti-pollution laws. Current bill clarifies and extends word "person" to include governmental agencies and municipalities.

COASTAL WATERS BILL (S589) — Calls for regulating the discharge of oil, heated effluents, poisonous or other injurious substances that cause fish kills in coastal waters. Under the law, penalty for illegal discharge could run as high as a \$5,000 fine and one year in jail.

MASS TRANSPORTATION BILLS (S184, S1034, H855) — These bills involve proposals for a legislative amendment to the constitution providing for the expenditure of money from the Highway Fund for mass transportation purposes. Restoration of mass transit would help cut down dependence on the automobile, one of the prime sources of air pollution.

MASSACHUSETTS ENVIRONMENTAL POLICY ACT (H5134A) — Filed by Governor Sargent, the bill seeks to insure that no major state project significantly affecting the environment will be undertaken until all environmental ramifications and effects of the project are reviewed.

MINERAL RESOURCE BILL (H3588) — Designed to conserve mineral resources and to prevent despoiling the landscape, this bill seeks to establish state guidelines for land-mineral extraction and site rehabilitation, and, most specifically, reclamation of unsightly gravel pits.

NOISE POLLUTION BILL (H5104) — Calls for a sound-level limit not exceeding 82 decibels for all snowmobiles manufactured after July 1, 1972 and sold or operated in the state.

PHOSPHATE BILL (H384) — Calls for a ban throughout the state on the sale of detergents containing phosphates. While not a complete ban (some phosphates will be permitted), this bill would affect a number of detergent manufacturers selling in the state.

RECYCLING BILLS (S208, S246, H255, H1495) — These bills call for a ban prohibiting use of nonreturnable glass, plastic or metal containers.

RINKS AND POOLS BILL (H5161) — Authorizes \$5 million for DNR to expand its program of building and operating skating rinks and swimming pools throughout the state.

SOLID WASTE DISPOSAL BILL (S1192) — Approximately 7 million tons of refuse are being generated each year in the Commonwealth, and the state is running out of places and means of disposal. To meet the problem this bill, filed by the Governor, calls for mandatory formation of solid waste districts and financing of district facilities through member communities.

WATER POLLUTION BILL (H386) — Grants DNR authority to order communities to draw up plans for construction or improvement of sewage treatment plants. If a community fails to comply with the order, the state may take over the job and charge the town all planning costs.

WETLANDS PROTECTION BILL (H5134B) — Filed by the Governor, the bill grants local communities authority to control development on their own wetlands. It also broadens the scope of present laws under which wetland development can be restricted to include not only protection of proper flood control and water supply but also protection of fish and wildlife and assurance of public health and safety.

BOSTON HARBOR ISLANDS: RENAISSANCE AHEAD?

BIRTH OF A HARBOR

Eons ago the crust of the earth shifted. Earthquakes were set off, volcanoes erupted and titanic floods were unleashed. As the earth shook and rocked, a block of its crust broke off and sank, forming a lowland plain — the Boston Basin. Millions of years passed and then the glaciers moved down from the north, grinding down ridges and leaving smooth, narrow hills of glacial till called drumlins. As the glaciers melted the sea rose in the basin and surrounded many of the drumlins. These drumlins became the islands of Boston Harbor.

Legend says that the first white man to set eyes on what is now Boston Harbor was the Norseman Leif Ericson in 1003 A.D. Perhaps John and Sebastian Cabot, English explorers sailing down the North American coast in the 15th century, were the first to spot it. Historical records suggest, though, that it was either Bartholomew Gosnold, an English voyager to this part of North America in 1602, or a Frenchman named DeMonts in 1603, who first discovered the harbor.

In any event the first white man to settle in the area was the Reverend William Blaxton, an Anglican clergyman who in 1625 took up residence on what is now Beacon Hill. This one-man settlement became a community when the Massachusetts Bay Company, a group of Puritans headed by John Winthrop, landed on "Blaxton's Peninsula" in 1630. Shortly afterward they renamed the settlement "Boston."

From that time on Boston Harbor flourished as a great port. By 1660 virtually all imports from the mother country to New England passed through Boston Harbor. By the middle of the 19th century Boston had become a top-ranking international port and Donald McKay's clipper ships, built in East Boston shipyards, plied the seas from Canton to Cairo. While the harbor has deteriorated in the 20th century, containerization, a new method of handling greater amounts of cargo in smaller spaces, may restore Boston Harbor to commercial prominence.



Courtesy of the Boston Athenaeum

Boston Light, situated on Little Brewster Island at the narrow entrance of the harbor, has been a steering point for mariners for more than 250 years. Gun at base of lighthouse was fired in foggy weather to warn ships of breakers. Lighthouse keeper would also ring fog bell in thick weather. Engraving appeared in Gleason's Pictorial Drawing-Room Companion, March 20, 1852. Below: Harbor skyline today.





Busy Inner Harbor: fishing boats, pleasure craft and working cranes intermingle

Hand in hand with the history of Boston Harbor is that of the islands. In the 17th century the islands' primary use was for agriculture. On most of the islands the original forest cover was cleared for firewood, grazing and crop growing. In the 18th century the islands also became a popular resort area. Excursionists from the mainland flocked to the inns and guesthouses to imbibe the salty air and indulge in the illicit pleasures of gambling and boxing matches. When a wave of social reform washed over the 19th century, the islands furnished a convenient place to establish hospitals, reformatories, poorhouses and prisons. In fact one of the most notorious Union prisons for Confederate soldiers during the Civil War was established at Fort Warren on George's Island. Still standing, though in crumbling condition, the five-bastioned granite fort has been designated a National Historic Site by the U.S. Department of the Interior.

Although the islands had provided a coastal defense ever since Colonial times, in the 20th century many military posts and installations were erected and their predominant use became defense. With outbreak of World War I, and then World War II, the strategic significance of the harbor greatly increased. In World War II nine islands in the harbor were fortified and the entrance to the harbor was heavily mined and fenced off by an underwater torpedo net. Radar-controlled coastal batteries, which could hit an enemy ship 30 miles away, were set up and anti-aircraft batteries, along with those at Portsmouth, N.H. and Providence, R.I., could blanket the skies above the entire Massachusetts coast.

After the war, the period of neglect began. Guns were dismantled, fortifications abandoned and the remaining installations became overgrown with thick brush and weeds. Docks and piers decayed and deteriorated, their rotting wood adding to the harbor's flotsam. Once the site of some of the country's most progressive hospitals and prisons, the islands became graveyards for these ghostly institutions and desolate repositories for society's unwanted — human beings as well as human wastes. Abandoned and neglected, indeed almost forgotten except for an occasional flurry of interest in their renewal, the islands lie dormant, waiting to be utilized again.

COMMISSIONER'S CORNER: CREATING A HARBOR ISLANDS PARK

Boston Harbor Islands are one of the Commonwealth's most valuable yet misused and neglected natural resources. If we continue to ignore these islands, or worse still commercially develop them, their fragile ecology could be irreparably damaged, this great natural resource destroyed.

But now a design for the Boston Harbor Islands has been developed. If implemented it would protect the islands and reclaim them for large-scale public use and enjoyment. The plan was prepared for our Department by the Metropolitan Area Planning Council under the guidance of the Harbor Islands Advisory Committee which is composed of representatives from communities bordering the harbor, state agencies, and citizens' groups. A bold and imaginative concept, the proposal's fulfillment would create a vast ocean-based urban park unique in this country.

Interest in a water park plan for the Boston Harbor Islands dates back to 1966. Following an earlier MAPC report, a great many state and private conservation groups, as well as individual state legislators and concerned citizens, be-

gan to generate support for a publicly owned Harbor Parks system. A special commission was established which became known in 1969 as the Boston Harbor Islands Commission. As a consequence of this commission's report, legislation was drawn up, passed by the legislature and signed into law by Governor Francis W. Sargent as Chapter 742 of the Acts of 1970. This act provides for "the acquisition of the islands in Boston Harbor by the Department of Natural Resources for the purposes of recreation and conservation."

Truly historic legislation, Chapter 742 authorizes DNR to acquire the privately-held islands in the harbor, prepare plans for the recreation and conservation use of all islands, and direct and coordinate the development on other islands owned by public agencies, cities or towns. The bill authorizes a \$3.5 million bond issue to finance planning and acquisition of the islands.

A legal mandate, however, is not enough to turn the dream of a Boston Harbor Park into reality. Our Department can provide the leadership and coordination of the planning, acquisition and development, but if the plan is to succeed, there must be a profound commitment and lasting spirit of cooperation on the part of both the private and public sectors.

At present no less than 13 state and federal agencies command some responsibility and control over the harbor. MDC and the City of Boston own several high-potential recreational islands, and every community bordering the harbor has its own agencies and authority. All the disparate activities of the various levels of government and separate agencies must be directed and coordinated.

Adding to this government mélange is the fact that much of the shoreline is owned and operated by private interests. If the harbor is to be available for everyone to enjoy, there will have to be more boat ramps and public access to the sea, more open space to provide harbor views, improved beaches and dock facilities, and boat and fishing rental concessions — all of which will require a considerable input from private interests and, most importantly, a massive cooperative effort between the public and private sectors.

Obviously, the Boston Harbor Islands Plan will not be implemented overnight. Nevertheless, it is quite possible that within five years public excursions to the islands will be a common recreational experience. And who knows, within a decade we may be taking underwater tours, exploring the mysterious depths beneath Boston Harbor.

Arthur W. Brownell, Commissioner

lution Control can better regulate the handling of oil at terminals and can undertake rapid cleanup of oil spills. While oil pollution can not be totally eliminated, further improvement should come about through increased surveillance of potential pollution sources and strict enforcement of sewer use regulations.

SEWAGE — By far the greatest source of pollution in Boston Harbor. Significant progress has been made since 1968 when MDC put into operation its sewage

treatment plant at Deer Island. Previously much of the sewage from 45 communities, with a population of more than 1.5 million, had been dumped, mostly untreated, into the harbor. It is now pumped through underground tunnels, screened, and heavily chlorinated at Deer and Nut islands; then the treated wastewater is released into the sea.

Sewage pollution, however, is still far from being under control. Many communities have antiquated combined storm and sanitary sewer systems which in

rainy periods carry raw sewage, along with stormwater runoffs, into the harbor. There are some 120 of these overflows into the harbor, including those from the Charles, Mystic and Neponset rivers, all of which empty into the harbor.

Several plans are under way that could help solve the sewage problem: Cambridge has a project to separate its combined storm and sewer systems; in Chelsea and Somerville, tidegates that prevent saltwater intrusions into the sewer system will be repaired; Boston

HARBOR ISLAND HIGHLIGHTS

A thumbnail sketch of major islands and plans for recreational development.

ISLAND	DESCRIPTION	RECREATIONAL DEVELOPMENT PLAN
Deer Island	Once forested, island is now mostly covered with grass and weeds. Dominant physical feature is 100-foot-high hill. Major man-made structures include abandoned Fort Dawes, Suffolk County House of Correction and MDC sewage treatment plant.	Three-mile bicycle trail, children's recreation area, informal park for viewing passing ships and Boston skyline, picnic areas, beach, environmental interpretative center, ferry landing, small boat dock and offshore moorage area.
Long Island	The largest in the harbor (213 acres), Long Island is connected to Moon Island and the mainland by causeway. Physical features include narrow eroded hill in southwestern end, rocky narrow beaches, low wetlands and clamflats on the westerly shore. Man-made structures are abandoned Fort Strong, cemetery and Long Island Chronic Disease Hospital, a complex of 20 buildings.	Visitor center-ferry landing, grass playgrounds, restored Fort Strong, swimming beach, picnic and outdoor eating areas, wetland interpretative center, trail system and bike path, boat dock and fishing pier, group camping sites.
Thompson's Island	Part of island is salt marsh teeming with wildlife. Open fields, stands of hard and softwoods, old apple orchard make island one of the most attractive in harbor. Thompson Academy located here.	Model farm similar to Audubon's Drumlin Farm, saltmarsh wildlife sanctuary, swimming beach.
George's Island	Twenty-eight acre island occupied mainly by five-bastioned granite Fort Warren — a national historic landmark.	Major stop on Boston-Nantasket ferry line, small swimming beach, family picnic facilities, restored Ft. Warren and military museum offering interaction of history and environment.
Gallop's Island	Covered with sumac and wild roses, a few trees and open grassy areas. Island consists of one large hill overlooking the entire harbor and extending down to long sandbar at eastern end.	Swimming beach, playground and picnic areas, clambake sites, refreshment pavilion and outdoor dining area, dock and ferryboat landing.
Lovell's Island	Most of island covered with sumac and dense brush. One of best sandy beaches in harbor located here.	Swimming beaches, campgrounds, playfields, restoration of fortifications.
Peddock's Island	Island is divided into five hills connected by long, low sandbars. Beaches located on both sides. An extensive complex of old brick structures, formerly Fort Andrews, remains.	Three-mile bike loop, group camping, playfields, saltmarsh interpretative center, wildlife management area, Harbor Island Inn, restoration and conversion of Ft. Andrews buildings into environmental education center.
Brewster Islands	With exception of Great Brewster, these small islands are jagged outcrops of solid bedrock reminiscent of Maine coast. Boston Light, national historic landmark, located on Little Brewster; Graves Light, on Graves Island.	Creation of Boston Harbor Outer Sanctuary to assure preservation and natural management of valuable resource, primitive campsites, self-guided nature trails, small boat docks, underwater park for scuba divers to explore old shipwrecks and marine environment.

be restricted for the most part to contemplation of the eternal sea.

Nearly every island will undergo some form of conservation development. During World War II many trees were knocked down and areas cleared for fortifications. These areas have remained either barren or covered with thick impenetrable brush and noxious weeds. Selective clearing of undesirable underbrush, such as sumac and poison ivy, will be undertaken. Extensive tree planting and landscaping will be carried out to prevent further erosion of banks, provide shelter from wind, rain, and the hot sun, and furnish food base for birds and wildlife. At Spectacle Island, where part of the island has become a 100-foot-high garbage dump that still smolders from underground fires, landscaping will help eliminate both a health hazard and an eyesore.

Conservation development, in turn, will provide the base for recreational development. Plantings and landscaping, particularly with evergreens, will provide an attractive setting for campsites and picnic areas. Plant and vegetation alterations will also improve the natural environment for footpaths and bike trails that will rim some of the islands, enabling one to view the Boston skyline and bustling harbor traffic. In addition conservation development will provide the starting point for the restoration of beaches, docks, marinas and piers, making possible swimming, boating and fishing.

Part of the plan for recreation development calls for the rich historical and military heritage of the islands to be restored and integrated with the natural surroundings. Even now Fort Warren on George's Island — a national historic landmark which has been only partially restored — attracts some 70,000 visitors each year. Restoration of other historic and military installations, such as Fort Independence on Castle Island and Fort Standish on Lovell's Island, will offer on-site educational experiences along with the more conventional outdoor recreation opportunities.

There are a host of other fascinating conservational-recreational possibilities visualized: a saltmarsh sanctuary and a model farm (representing farming activities down through the centuries) on Thompson's Island; a wildlife management area and an inn (with lodging and dining accommodations) designed in a 19th century style on Peddock's Island; an underwater park for scuba diving off the Brewsters; and several environmental interpretative centers located on various islands throughout the major subsystems of Boston Harbor in Dorchester, Quincy and Hingham bays.

The crux of the Boston Harbor Islands Plan is inexpensive, public, waterborne transportation. Without low-cost public transportation, access to the islands will remain limited to the relatively few affluent boatowners. To open up the islands for everyone, a ferry route service, de-



Sea and solitude: one of the rocky Brewsters

signed around the present Boston-to-Nantasket "spine," is proposed.

One end of the spine would be Nantasket, which already draws thousands of excursionists in the summer. The other end would be anchored in the vicinity of Long Wharf on the Boston waterfront, which is a focal point for both highway and public transit systems. In between the two points ferries would stop at Long, George's and Peddock's islands; alternate routes would include stopovers at Thompson's or Deer islands. Smaller vessels will travel to nearby Gallop's and Lovell's islands or to the more distant Brewsters.

Time schedule: the Harbor Islands Park system should be in operation within five years, with final work done by 1990. The total cost of the Park is an estimated \$27 million.

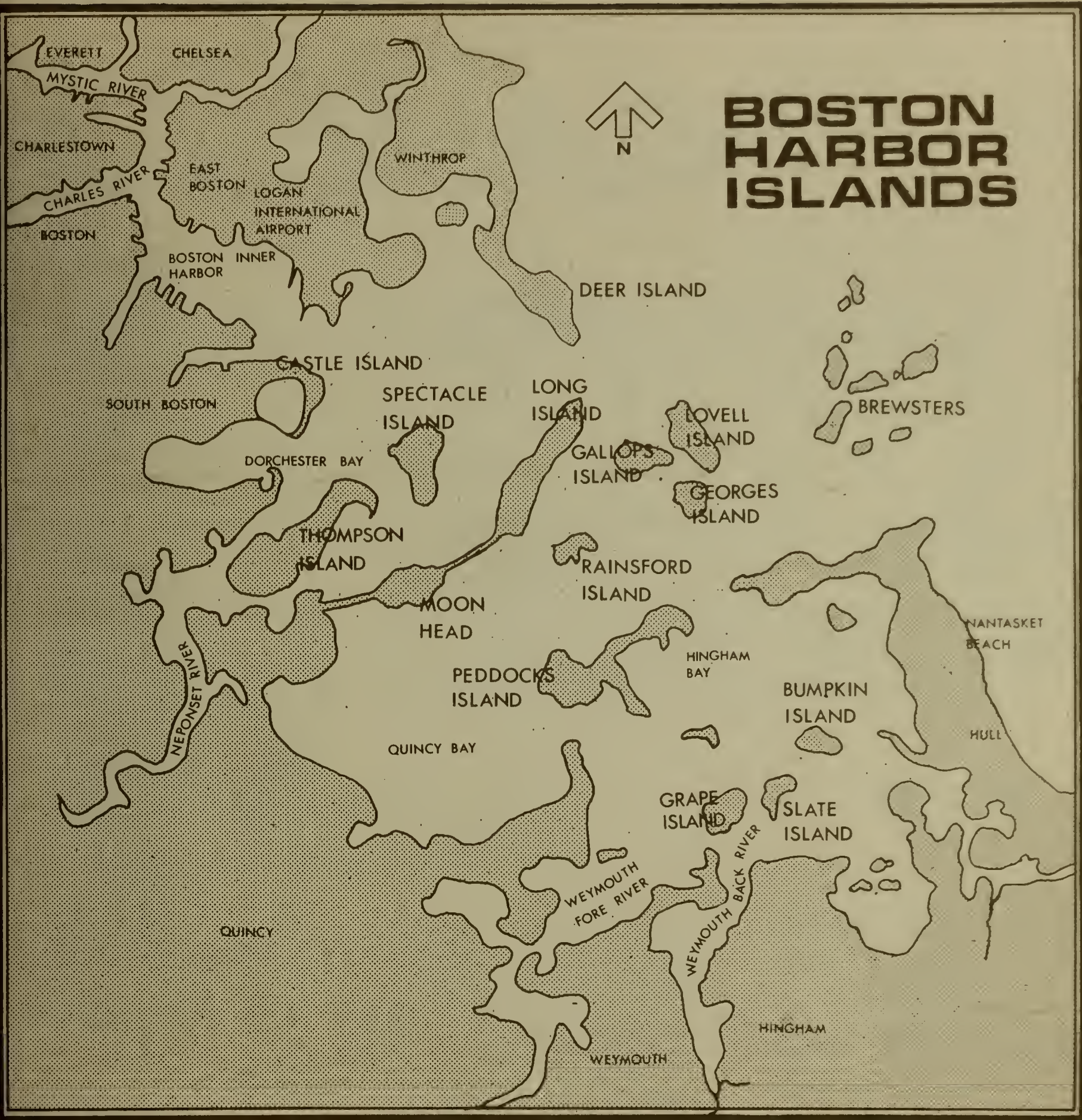
STATUS REPORT: BOSTON HARBOR'S WATER

One key to the success of the Boston Harbor Plan is reduction of harbor pollution. If the recreation potential of the islands is to be fulfilled, harbor water quality must be good enough to allow water-based activities such as swimming, boating, fishing and clam digging and to provide a setting for aesthetic enjoyment. Over the years portions of the harbor, especially the Inner Harbor, have become polluted. But in recent years, through the efforts of such agencies as MDC, DNR's Division of Water Pollution Control, and the City of Boston, dramatic improvements in the quality of the har-

bor's waters have taken place. Below is a summary of current pollution conditions in the harbor and prospects for further water quality improvement.

DEBRIS — The most visual form of pollution, a hazard to navigation as well as an eyesore. Flotsam and jetsam floating in the harbor come from rotting piers and wharfs, aging buildings along the Boston waterfront, and sunken hulks, some as old as 300 years. Refuse is also dropped into the harbor by ships and shoreline residents. Just about anything thrown into the Charles, Mystic or Neponset rivers ends up in the harbor. Several programs are now under way to control visual pollution. Among these are MDC island cleanups, DPW's program for removing dilapidated piers, and the U.S. Army Corps of Engineers' involvement with identifying rotten hulks, pinpointing waterfront structures in need of demolition or repair, and keeping the harbor free of large debris that could endanger navigation.

OIL — Can be as harmful to the ecology of the harbor as sewage. Floating oil clings to waterfowl, fish and other marine life. It also settles to the bottom, posing a lasting pollutant problem. Oil enters the harbor from tank farms along the Chelsea, Mystic and Weymouth Fore rivers. It comes too from accidental spills, washing-out residues from oil tankers, and wastes from countless gas stations that connect into municipal sewer systems. Oil pollution, however, has been greatly reduced. Under recent state oil pollution laws the Division of Water Pol-



THE BOSTON HARBOR ISLANDS PLAN

Boston Harbor, an area of some 50 square miles, is bounded by 180 miles of shoreline and dotted with 30 islands totalling about 1200 acres. Lying within a 25-mile radius of a population of more than 3 million, the harbor equals the combined areas of Boston and Brookline. To fulfill the vast and variegated potential of this open space, the Boston Harbor Islands Plan has been designed as a total system offering a complete recreational experience.

Phase I of the plan calls for the De-

partment of Natural Resources to acquire all privately owned islands in the harbor (about half the islands are privately owned). In conjunction with several agencies and communities, particularly the MDC and the City of Boston who own many key recreational islands, development will proceed cautiously to insure that plants, wildlife and other natural features of the islands will not be destroyed.

Phase II, development of the islands, will range from intensive utilization for recreation to passive use for conservation. The degree to which an island is devoted to active or passive recreation

will depend on its natural characteristics and its accessibility to public ferry transportation. Long Island, for example, which is accessible from the mainland by car as well as by ferryboat and which can support large numbers of people, will be intensively developed. In addition to the construction of conventional playground facilities, provisions will be made for camping, swimming, boating and hiking. On the other hand, the Brewsters, a group of small rocky islands at the entrance to Boston Harbor, will be maintained primarily as a conservation area. To preserve the delicate ecosystem of these islands, man's activities there will

THIS PUBLICATION WAS PRINTED ON 100% RECYCLED PAPER.



intends major renovation of its sewer system; and along inflowing rivers and the harbor shoreline MDC has proposed a system of chlorination-detention facilities that will hold chlorinate-polluted water before releasing it back into the stream or harbor. Plans are also under consideration for advanced sewage treatment at Deer and Nut islands.

From a recreational standpoint, the water quality along the beaches is generally suitable for bathing and other water-contact sports. It is true that the Inner Harbor is polluted and improvement calls for the level of water quality to be suitable for boating only. But in the rest of the harbor — the Outer Harbor, Dorchester, Quincy and Hingham bays — the water quality is good and getting better.



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The following are major environmental bills either passed into law (P) or defeated (D) in the Massachusetts legislature this year.

CHARLES RIVER CLEANUP ACT (Ch. 584, Acts of 1972) — Allocates \$7 million to the MDC for cleanup and restoration of the Charles River. **P**

CITIZENS' RIGHTS-OF-ACTION BILL (Ch. 219, Acts of 1972) — Last year legislation was passed enabling citizens to take to court "persons" violating existing antipollution laws. Current bill clarifies and extends word "person" to include governmental agencies and municipalities. **P**

ENVIRONMENTAL CAPITAL OUTLAY BILL (Ch. 803, Acts of 1972) — Omnibus bill provides \$121 million bond issue for acquisition and upgrading of open spaces and recreational areas and improvement of rivers and streams. The Metropolitan District Commission will use lion's share of bond issue to clean up pollution in Boston Harbor, rehabilitate Franklin Park Zoo in Boston and enlarge and improve recreational facilities along the Mystic River. The Department of Natural Resources has been allocated \$9 million for acquisition, planning and construction of recreational facilities, of which \$4 million will be used to purchase South Cape Beach in Mashpee, the last warm-water beach on the south shore of Cape Cod. **P**

HEATED EFFLUENTS BILL (Ch. 789, Acts of 1972) — Establishes legal responsibility for fish kills due to discharge of oil, heated effluents, poisonous or other injurious substances into coastal waters. Under the law, penalty for illegal discharge could run as high as a \$5,000 fine and one year in jail. **P**

INLAND WETLANDS BILL (Ch. 782, Acts of 1972) — Strengthens present 1968 Inland Wetland Protection Act through procedural changes. Appeal procedure from a restrictive order on wetland development now requires a judicial hearing. Formerly, procedure required only written notice of objection from landowner. **P**

MASS TRANSPORTATION BILLS (S184, S1034, H855) — These bills involve proposals for a legislative amendment to the constitution providing for the expenditure of money from the Highway Fund for mass transportation purposes. Restoration of mass transit would help cut down dependence on the automobile, one of the prime sources of air pollution. **D**

MASSACHUSETTS ENVIRONMENTAL POLICY ACT (Ch. 781, Acts of 1972) — This bill seeks to insure that no major state project significantly affecting the environment will be undertaken until all environmental ramifications and effects of the project are reviewed. **P**

MINERAL RESOURCE BILL (H5632) — Designed to conserve mineral resources and to prevent despoiling the landscape, this bill seeks to establish state guidelines for land mineral extraction and site rehabilitation, and, most specifically, reclamation of unsightly gravel pits. **D**

NOISE POLLUTION BILL (Ch. 62, Acts of 1972) — Calls for a sound-level limit not exceeding 82 decibels for all snowmobiles manufactured after July 1, 1972 and sold or operated in the state. **P**

PHOSPHATE BILL (H5728) — Calls for a ban throughout the state on the sale of detergents containing phosphates. While not a complete ban (some phosphates will be permitted), this bill would affect a number of detergent manufacturers selling in the state. **D**

SOLID WASTE DISPOSAL BILL (S1192) — Approximately 7 million tons of refuse are being generated each year in the Commonwealth, and the state is running out of places and means of disposal. To meet the problem this bill, filed by the Governor, calls for mandatory formation of solid waste districts and financing of district facilities through member communities. **D**

WATER POLLUTION BILL (H5587) — Grants DNR authority to order communities to draw up plans for construction or improvement of sewage treatment plants. If a community fails to comply with the order, the state may take over the job and charge the town all planning costs. **D**

WETLANDS CONSOLIDATION ACT (Ch. 784, Acts of 1972) — Combines Jones Act (coastal wetlands) and Hatch Act (inland wetlands) under one law and grants local communities greater authority to control development by placing initial restrictions on their own wetlands. It also broadens scope of present laws under which wetland development can be restricted to include not only protection of proper flood control and water supply, but also protection of fish and wildlife and assurance of public health and safety. **P**

THE NEW MATH: CONSERVATION EQUALS DOLLARS SAVED

Americans' appetite for economic development seems to be insatiable. Each year, in Massachusetts alone, thousands of acres of open-space and farm lands are eliminated and replaced by office buildings, houses, shopping plazas and parking lots. Yet many local officials, on the assumption that unconditional economic growth will provide a wider tax base for their communities and grant financial relief for soaring property taxes, continue to argue for more commercial and residential development.

"It ain't necessarily so!" The realization has dawned that uncontrolled and unplanned development ruins the landscape and contributes to a declining quality of life. Aesthetics aside, a point has been reached where the economics of conservation can make more dollars and sense than the economics of growth.

Increasingly, the facts show that development, particularly residential development, costs a town more money for more services than the amount of new tax revenues flowing in from additional development. In other words, wherever more houses go up, more services — more road maintenance, snowplowing, water and sewage lines and schools must be provided. The inevitable result: up go property taxes to pay for these new services.

The record of municipal growing pains is being statistically documented in the Commonwealth. Robert A. Lemire, Chairman of the Lincoln Conservation Commission and long-time observer of growth and land-use patterns in the state, claims that every time a new house is built in a community the town must dig deeper into its pockets. Lemire derives his conclusions from a simple arithmetic formula referred to as a "shortfall." A shortfall, as Lemire defines it, is the cost of providing new services over the additional tax revenue coming from a new home.

Lemire estimates that in Massachusetts annual shortfalls per new house will range from \$400 to \$1800. In his study of rapid-growing towns, Lemire calculates



Suburban sprawl—the price tag of uncontrolled development

that annual shortfalls per new house will average \$443 in Topsfield, \$850 in Harvard, and \$1800 in Andover.

These findings are borne out elsewhere. For example, Wayland hired a team of professional analysts to study costs of residential development versus costs of the town's purchasing land for conservation and recreational purposes. The report concluded that developing 1250 acres of land for 550 new homes under present zoning laws would cost Wayland taxpayers \$328,350 a year more than the additional tax revenues from these new homes. This would mean a \$7.75 increase in the tax rate.

On the other hand, if Wayland purchased this 1250-acreage for conservation and such passive recreation purposes as hiking, picnicking and swimming, it would cost the taxpayers only \$181,000 a year more, instead of \$328,350. This would add only \$4.25 to the current tax rate, contrasted to a \$7.75 increase for residential development.

Lemire and other conservation-cost analysts point out that the key to defraying land acquisition costs lies in taking advantage of long-term borrowing and state and federal reimbursement programs. The federal Bureau of Outdoor Recreation's Land and Water Conservation Fund and the state's Self-Help

Program administered by DNR can reimburse communities up to 75% of the cost of purchasing land for conservation and outdoor recreation purposes. In addition a town can cut its land purchase costs through accepting gifts of land or placing conservation restrictions on the land. In Wayland's case, the \$3.5 million purchase price for 1250 acres of open space would cost the town, over a 20-year period, only \$181,000 a year.

The obvious question, of course, is: If towns begin opting to protect their open spaces from residential development, where can new homes be built to house the growing population? A valid question. But to answer this a basic environmental principle must be first understood: that different kinds of land serve different purposes. Wetlands, for example, are more suitable for flood control and water supply protection than for housing development. A hilly area with clay soils might better serve a town as a sanitary landfill site, while a housing development might be better off clustered on another segment of land.

The essential point is that a balance should be struck between development and open space and that land use should not be left to random, uncontrolled developmental forces. For the price tag of unfettered growth can turn out to be much greater than the costs of conservation.



THE MYSTERY OF THE RED TIDE

Gonyaulax tamarensis is a microscopic planktonic organism, just one of many forms of plankton and algae that provide a major food source for fish and shellfish. But when this ordinarily harmless, single-celled organism proliferates into a massive, rust-colored "bloom" or "red tide," it can become a destructive floating army that upsets the marine environment, devastates commercial shellfishing and even paralyzes man's respiratory system. This phenomenon was alarmingly evidenced off the Massachusetts coast last fall.

Except for a minor appearance of this toxic plankton detected off Cape Ann in 1958, Massachusetts seemed safe from the red tide scourge. It was generally believed that the state's coastal waters were either too warm for the Canadian variety of red tide to flourish in or too

cold for the southern variety. But for some reason, scientifically inexplicable as yet, last fall the red tide invaded bays and estuaries up and down the New England coast from Maine to Cape Cod.

Theories abound as to what triggered the red tide invasion. Perhaps it was an increase in photosynthetic action caused by optimum conditions of sunlight and water that activated a population explosion of the tiny organisms. Perhaps the red tide bloomed in saltwater bays and estuaries diluted by freshwater runoffs after heavy rains. Perhaps the rain also accounted for an upsurge of nutrients (which plankton feed on) that flowed into coastal waters and resulted in the multiplication of toxic plankton. Most marine biologists think it was a rare combination of all these environmental conditions — and of other factors still unknown. But as one marine biologist confessed: "When you come right down to it, we really don't know what caused the red tide."

The mystery of the red tide extends to its effect on other living things. Soft-shell clams and mussels exposed to the red tide became infected and unsafe to eat (see shellfish glossary). These mollusks are filter feeders which pass many gallons of water through their gills daily and accumulate the plankton's poison in their gills and alimentary systems. Scallops and hard-shell clams (or quohogs) are also filter feeders and were exposed to the red tide. Yet while scallops were affected, inexplicably hard-shell clams did not accumulate any significant amount of the toxin. Finfish, lobsters, shrimp and crabs are not filter feeders and hence were unaffected. (However, the Florida variety of red tide can be lethal to fish in southern waters.)

Poisoned clams eaten by some wildfowl, such as gulls and black ducks, caused their death. Some persons suffered paralytic shellfish poisoning. Fortunately, none of the 27 victims in Massachusetts died. The fact is, however, that toxicity levels found in some clam samples during the outbreak were dangerous. According to one scientist, gram for gram *Gonyaulax tamarensis* is 50 times as powerful as curare, a plant from which some South American Indians extract poison to tip their arrows.

With the ebbing of the red tide the task

of assessing and restoring the ecological and economic damage began. The Small Business Administration declared the Massachusetts shellfish industry a disaster area and commenced funneling aid to the industry. The state's Division of Marine Fisheries and Department of Commerce have requested funds for towns to clean up the clam beds and provide jobs for unemployed shellfish workers. In conjunction with the state Department of Public Health, Marine Fisheries is also working to establish programs for shellfish research, consumer education, and most important, in terms of protection for the seafood industry and the public, surveillance and control of shellfish stock and harvesting areas. More money and manpower, of course, will be required to carry out these programs.

The red tide could strike again — maybe next year, or two years from now. Nobody knows. But with surveillance and monitoring programs in operation, there should be no repetition of the crisis that occurred last fall.

WHAT IS THE NEW WETLANDS PROTECTION ACT?

Massachusetts, a pioneer in wetland protection, has consistently sought to strengthen its wetland laws. Legislation consolidating the former inland (Hatch Act) and coastal (Jones Act) wetland laws became effective on October 16, 1972. The new legislation broadens the scope of environmental protection and grants local authorities greater control over wetland development. The following questions and answers explain the major aspects of this vital new law.

1. Q What is the New Wetlands Protection Act?

A The New Wetlands Protection Act — Chapter 784 of the Acts of 1972 — is a regulatory law controlling, not banning, wetland development.

2. Q What lands are subject to the law?

A Any bank, beach, dune, flat, marsh, meadow or swamp bordering on the ocean; any creek, stream, river, pond or lake; or any land subject to tidal action, coastal storm flowage or flooding.

SHELLFISH GLOSSARY

Bay Scallop — Filter feeder. Eaten cooked or raw. Although scallops were affected to a certain extent by the red tide off Cape Cod, there was no danger posed from scallops because the entire intestinal tract (poison accumulates here) is thrown away. Only part we eat is the adductor muscle which opens and closes the shell.

Lobster — Always eaten cooked. Not a filter feeder and hence not affected by the red tide.

Mussel — Filter feeder. Not important commercially but eaten to a considerable extent (fried, boiled and stewed) by those who have a penchant for European delicacies. Considerably contaminated by red tide.

Oyster — Filter feeder. Eaten raw or cooked. Not affected by red tide because of its geographical location out of the epidemic area.

Quohog — (hard-shell clam) — Filter feeder. Small variety is eaten raw (popularly called cherrystone or littleneck); large clams are cooked and used in stews. For unknown reasons not significantly affected by red tide.

Soft-shell Clam — Filter feeder. Heavily contaminated by red tide because of its organic structure and its intertidal zone habitat.

THE TREE CONNECTION

Trees contribute to man's oxygen supply, cleanse the air by absorbing carbon dioxide, moderate air temperatures by using the sun's energy to evaporate water in the leaves, mitigate heavy winds, help prevent soil erosion, supply lumber and paper products, and provide food and shelter for birds and wildlife. But a rare tree or stand of trees is also something beautiful to look at and contemplate. Listed below are the locations of some exceptional tree stands and individual trees in Massachusetts.

Adams: Mount Greylock State Reservation. Because of its high altitude (summit: 3491') Greylock, on its upper slopes, is an island of rare alpine vegetation. Red spruce, yellow birch, mountain ash, mountain maple, and balsam fir are dominant here. These tree types, subjected to high winds, subzero temperatures and snow and ice abrasion, remain in a perpetually stunted condition, creating a beautiful, wild effect. Stunted spruce attract the blackpoll warbler and Bicknell's thrush from the Canadian spruce-belt faunal region. These birds, rare to Massachusetts, are not known to nest anywhere else in the state.

Boston: Arnold Arboretum. Internationally recognized as one of the world's finest arboreta: 265 acres; 7000 different kinds of trees, shrubs, woody vines. Area has been designated a National Historic Monument.

Carlisle: Carlisle State Forest. A stand of about a dozen singularly unique enormous old white pines, all that remains of an extensive grove destroyed by the 1938 hurricane.

Charlemont-Florida-Hawley-Savoy: Mohawk Trail State Forest. Handsome plantations of red pine and one of the finest white pine stands in the Northeast. Savoy section of the forest near Florida contains a rare virgin stand of hemlock and northern hardwoods: sugar maple, beech, and yellow birch. Many of the trees have a diameter at breast height of 30 to 36 inches. Hemlocks and sugar maples in this stand may be as much as 400 years old.

Colrain: Harold O. Cook State Forest. An exceptional stand of Norway spruce planted in 1910; may equal best Norway spruce forests in Europe; the largest Norway spruce is 2' in diameter and over 100' high.

Cohasset: Whitney-Thayer Woods (southwest of Route 3A, opposite the end of Sohler Street). Outstanding second-growth stands (over 150 years old) of American beech, hemlock, white pine, black and yellow birch.

Deerfield: On Deerfield Academy campus. Approximately 250-year-old sycamore; circumference 25', height 80'.

Egremont: Located just north of South Egremont Center on Route 23: largest specimen of balsam poplar in the United States.

Hingham: Wompatuck State Park. A magnificent area that supports many unusual flora — some rare, some extremely rare. Forest of huge pines and hemlocks. Several coniferous climax-forest groves with trees up to 150 years old. Most distinguished old tree in the park is a white oak (approximately 200 years old) with strikingly beautiful low branches (approximately 70' long) that sweep out to within 3' of the ground. Tree's circumference: about 13'.

Holyoke: Mount Tom State Reservation. Distinctive heavily forested mountain area with a fine stand of natural, high-quality 100-year-old red pine.

Jamaica Plain: (Perkins Street) American beech. Formerly a National Champion Tree and still one of the largest of its species in the United States. Dimensions: height, 55'; circumference, 20.5'; crown spread, 78'.

New Bedford: Acushnet Cedar Swamp. A singularly unique 1800-acre tract that is one of the state's largest, wildest and most impenetrable swamps. Lush vegetative growth includes white cedar, white and pitch pine, mountain laurel and holly. Many parts of the swamp impart the sense of a true wilderness.

Petersham: Harvard Forest (3000 acres). One of the oldest studied and managed forest areas in the United States. Contains a composite of all typical New England forest growth types: northern forest, hardwoods, transition hardwoods, Appalachian and sand plain (scrub oak and pitch pine) forest types. Fisher Museum, located in the Forest, contains educational exhibits depicting the history of New England land use.

Princeton: (Pine Hill): Striped maple. National Champion Tree. Circumference, 3' 10"; height, 38'; crown spread, 25'.

Springfield: White cedar swamp. A 25-acre swamp, 15 acres of which are made up of a fine stand of coast white cedar. Occurrence: singularly unique.

Washington: October Mountain State Forest (approximately 16,000 acres). Large upland wilderness area with fine specimens of red spruce, sugar maple, white ash, northern red oak, white pine, red maple, hemlock, beech, black cherry and Norway spruce. Just north of Finerty Pond is an exceptionally beautiful virgin stand of hemlock as large as any in western Massachusetts.

Wenham: Pine and Hemlock Knoll Reservation (off Pleasant Street). A small wooded esker with swamps containing a magnificent stand of pines and hemlocks.



THE VALUE OF OUR WETLANDS.....



Inland wetlands such as Snake Pond in Plymouth act as natural catch basins. By storing then releasing rainwater slowly, wetlands prevent flash floods downstream. The gradual release of the water from the wetlands enables some of the stored water time to sink deep into the ground where it replenishes ground-water supplies, keeps springs bubbling, and fills wells. Draining, filling, or paving over a marsh or swamp will destroy its natural ability to store water. Instead the water will rapidly run off wasted over the surface of the earth—lost to reservoirs, lost to agriculture, useless to industry. In dollar terms—millions down the drain.



Coastal wetlands such as those found in Mashpee provide a buffer zone between the land and sea. In a heavy storm, the danger of flooding is significantly reduced as the salt marshes, acting like a natural catch basin, collect the waters pouring in from the uplands—waters that otherwise would flood the inhabited lowlands. Then slowly the marshes release the waters into the ocean. The wetlands also reduce the danger from tidal floods by absorbing the blows of pounding waves from the sea. It is estimated that without salt marshes the flood damage from one of the furious "northeasters" that periodically slam into the Massachusetts coast could exceed \$10 million.

3. **Q** Who can determine what lands are subject to the law?
A Conservation commissions, local governing authorities, and the Department of Natural Resources.
4. **Q** Who is subject to the law?
A Any person or governmental agency that intends to remove, fill, dredge or alter a wetland.
5. **Q** What procedure is necessary to comply with the law?
A Written notice of intention to develop or alter a wetland, and a plan describing the proposed activity and its effect on the environment, must be filed 60 days prior to undertaking any work. All permits, variances and approvals required by local law with respect to the proposed activity must be obtained before the written notice is sent. A written notice and a plan description should be sent to the local conservation commission. If no conservation commission exists in a particular city or town, these documents should be sent to a board of selectmen, a mayor, or a city council. Copies of notice and plan should also be mailed to the Departments of Natural Resources and Public Works.
6. **Q** What action is required of conservation commissions?
A Within 21 days of the receipt of written notice, the local conservation commission must hold a public hearing on the proposed project. If a conservation commission determines that an area is vital to public or private water supplies, groundwater supplies, flood control precautions, storm damage prevention, prevention of pollution, or protection of shellfish lands or fisheries, the commission must issue an Order of Conditions relative to the proposed activity within 21 days after the public hearing.
7. **Q** What is an Order of Conditions?
A An Order is a set of conditions regulating a project to insure that the activity will have no adverse effect on water supplies, storm and flood prevention, pollution prevention or fisheries protection. In effect, the Order calls for the owner to develop his wetlands in accord with the public's interest and safety.
8. **Q** Is an Order of Conditions set down by a conservation commission final?
A It may be. However, any person aggrieved by an Order of Conditions, any owner of land abutting the area of the proposed project, any 10 residents in the town, or the Commissioner of Natural Resources may request the Department of Natural Resources to review the case. The request must be made within 28 days after the local public hearing. Upon receipt of the request for a review, the Department of Natural Resources shall, by written order of the Commissioner, impose conditions on development or alteration of the project consistent with the environmental provisions of the New Wetlands Protection Act. DNR's Orders supersede those of any conservation commission. If a party is still dissatisfied with the Order, he may request a hearing or take the case to court.
9. **Q** What are the penalties for violating the New Wetlands Protection Act?
A A violator could receive a court restraining order to stop work on the wetland. A violator may be punished by a fine of not more than \$100 or by imprisonment for not more than 6 months, or both.
10. **Q** Who can enforce the violations?
A Local conservation commissions, local police departments, and the Department of Natural Resources.
11. **Q** If a person comes across a situation that appears to be a violation of the New Wetlands Protection Act, what action should he take?
A Contact immediately: local conservation commission, selectmen, mayor, or city council. Additional information may be obtained by contacting the Division of Conservation Services at any of the following offices:
Pittsfield: 442-8992
Amherst: 549-1461
Clinton: 365-5908
Townsend: 597-8802
Carver: 295-9300
Boston: 727-3170

COMMISSIONER'S CORNER: THE WATER WATCHERS

Another vital role for Massachusetts conservation commissions appears to be in the making: it's water watching. Water watching is a local program designed to measure water elevations of streams, ponds and swamps monthly, particularly during flood periods. This program would provide the basic data for community floodplain zoning and effective implementation of state wetland laws—both key components in wise land use and land-use planning.

So far Westborough is the only town which has established a water watch program. But Rowley is about to launch a program and conservation commissions in several other communities are showing interest.

The Westborough Conservation Commission was spurred on to set up a water data program to assist in determining the impact of development on Cedar Swamp. Currently Cedar Swamp, a 2000-acre wetland located in Westborough at the headwaters of the Sudbury River, is the center of a conservation versus development controversy. The conservation commission hopes that compilation of relevant water data will help settle the issue of the extent to which the high ground around Cedar Swamp can be safely utilized for industrial and residential development.

For assistance in collecting water data, the Westborough Conservation Commission applied to the state's Division of Water Resources. At the request of Water Resources, the U. S. Soil Conservation Service conducted free surveys to determine the strategic placement of gaging stations and installed eleven staff gages to measure water levels in Cedar Swamp. The conservation commission's job now is to maintain and read these gages and forward both monthly and storm readings to SCS and Water Resources.

From the vantage point of Chairman of the Massachusetts Water Resources Commission, I can see a great potential — with a statewide water watch program going far beyond the need to settle local disputes over floodplain zoning and land use. Water data collected and submitted by the state's 300 conservation commissions (out of the 351 cities and towns in Massachusetts) would unquestionably provide a much better basis for planning regional water programs and administering the state's inland and coastal wetland laws. Over the long run compilation of local water data would even help to hold down damage by floods similar to those caused by last summer's Hurricane Agnes.

Arthur W. Brownell

Arthur W. Brownell, Commissioner



Beaches are subject to the provisions of the New Wetland Protection Act

HOMARUS AMERICANUS

Lobster statistics compiled by the Division of Marine Fisheries for 1971 show that 3.8 million pounds of coastal lobsters were landed in Massachusetts ports, slightly higher than the catch for 1970. The wholesale value of lobsters was over \$4 million, a 10% increase over 1970. The most disturbing trend is the staggering increase in the wholesale price of lobsters. In four years the average price per pound has jumped from 89 cents to \$1.16, an increase of 30%. While the pounds of lobster landed are consistently increasing, marine biologists are concerned that continual heavy fishing pressure may be reducing lobster populations. One thing is certain, though, whatever the price of lobster there are people willing to pay for it.

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Publication of this document approved by Alfred C. Holland no. 5790.

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short subjects

FALL OF THE GYPSIES

A new insecticide called Phosvel might moderate the destruction wrought by gypsy moths — the caterpillars that annually defoliate thousands of forest acres in Massachusetts. The Bureau of Insect Pest Control aeri-ally sprayed Nickerson State Park in Brewster with Phosvel on an experimental basis last June. The results show that as much as 85% of the caterpillar population may have been wiped out.

Phosvel appears to have several advantages over other pesticides now in use to control gypsy moths. It is a nonpersistent organophosphate that breaks down into relatively harmless components within a week. It is more toxic to gypsy moth larvae (caterpillars) than Sevin and other insecticides now being used; yet it is low in toxicity to man, birds, fish and other wildlife. More testing is needed to measure Phosvel's full effects, but indications are that in coming years Phosvel could provide the much needed deterrent to control the gypsy moth menace.

TENTING TONIGHT ON THE NEW CAMPGROUNDS

A big expansion in the state's camping facilities is now under way. By the end of the year DNR will have completed construction of 840 new campsites, bringing the total of state-operated sites to 2400, an increase of more than one-third over camping facilities provided in 1971. Included in the expansion are 400 campsites at the new Wampatuck State Park in Hingham, only 17 miles from Boston; 100 sites at Scusset Beach State Reservation in Bourne; and 100 sites at Horseneck Beach in Westport.

The Horseneck Beach camping area will consist of new road construction, campsites with parking spurs, sewer and water systems, a trailer waste station, electricity, telephones, drinking fountains, and wash-water dumping pits. Cost of project: \$355,000. Despite this big expansion of state-operated campsites, the soaring demand for outdoor recreation and camping facilities will continue to outstrip supplies.

GERIATRIC CARE NEEDED

Lake Quinsigamond, the popular 722-acre recreational lake located between Worcester and Shrewsbury, has entered the first stages of eutrophication, the process by which a lake ages and eventually dies. According to a study published this year by the Division of Water Pollution Control, Quinsigamond's aging has been accelerated by urban pollution caused by intensive commercial and residential development around the lake. The biggest source of pollution comes from storm-water runoffs that carry silt and solids from streets and land-stripped areas and phosphates and nitrates originating from car washing operations and lawn fertilizers — all of which contribute to the deterioration of the lake's water quality.

The report offers several recommendations for slowing Quinsigamond's aging process. Among them: a program of improved street sweeping and catch-basin cleaning; erosion control and reforestation of land-stripped areas in the watershed; reduction of pollution stemming from car washing and lawn fertilization; continued study of the lake by Worcester and Shrewsbury to determine the feasibility of storm-water treatment as well as other pollution abatement methods; and establishment of a Lake Quinsigamond Commission to coordinate a comprehensive program for the lake's improvement.

FORD ROUNDUP

The Ford Foundation program established last year to assist municipal conservation commissions is beginning to pay off. The aim of the program is to strengthen community efforts and encourage greater citizen involvement in the protection of the environment. Foundation funds are not available for actual land purchase but they may be used to undertake appraisals, title searches and other preliminary studies necessary for eventual property acquisition. Grants range from \$750 to \$5000, of which the first \$750 is free of matching requirements. Some examples of the larger grants approved as of last summer:

Brookline-Boston-Newton — received \$5000 to plan and promote an open-space corridor connecting the three communities.

Cambridge — received \$5000 to plan strategy for open-space development of former city dump.

Carlisle — received \$4376 to inventory and analyze town land and water resources as a basis for further land-use planning and open space preservation.

Fitchburg — received \$4375 to prepare soil survey, enabling conservation commission to continue land-use planning.

Harvard — received \$5000 for study to improve and protect 315-acre Bare Hill Pond.

Harwich — received \$5000 to develop strategy to improve and protect Herring River watershed.

Nahant — received \$4876 for first phase of project to restore scenic quality of coastal land owned by town.

